Amendments to the Specification:

Please replace the paragraph beginning on page 1 at line 11 and continuing to page 2 line 6 with the following rewritten paragraph:

Market based control requires allocating a task (e.g. physical actuation) among a large number of producers, with each producer bidding for part of the task. The task is determined by consumer agents in the system (higher level controllers or external requirements). Each producer has a supply curve reflecting the actuation or control produced as a function of price and each consumer has a demand curve indicating the actuation needed as a function of price. The equilibrium price is determined by the price at which aggregate demand and aggregate supply are equal. The price in turn determines what each individual actuator produces and individual consumer uses such that the total actuation equals the demanded actuation. As the task changes, different combinations of producers combine to collectively accomplish the task. Such a market is robust against failure of individual agents and changes in tasks, while requiring communication of only one quantity, namely the price, in order to coordinate the actions of an arbitrary and even time varying number of producers. Advantageously, such a price based market system naturally provides a Pareto optimal solution that is near optimal allocation within a degenerate array, even though the full optimization problem is NP-complete. Furthermore, reconciling conflicting goals is readily accomplished by having each individual actuator or consumer individually weight the conflicting goals. The market produces a group resolution between conflicting goals.

Please replace the paragraph beginning on page 9 at lines 18 - 20 with the following rewritten paragraph:

C2

Figure 6 illustrates an analog circuit producer employing a light emitting diode as an actuator whose intensity is set by marketwire based control;

Please replace the paragraph beginning at page 11 at lines 13 – 16 with the following rewritten paragraph:

C3

Figure 20 is a comparison of the outputs of real and simulated markets of combined force and torque (only force is shown in this figure) for the control of air valve assemblies having three actuators oriented in each direction; and

Please replace the paragraph beginning at page 13 at line 19 and continuing to page 14 to line 4 with the following rewritten paragraph:

C4

Figure 3 illustrates a simple implementation of an analog market circuit 60 having consumers 66, actuating producers 68, connecting marketwire 64, and voltage source 62. Each consumer 66 has a demand curve that decreases linearly as the voltage on the marketwire 64 increases, and each producer 68 draws current from the wire that serves as the equivalent of a market. The conductances determine the slopes of the supply and demand curves as well as the marketwire 64 voltage level. If some producers produce less actuation, less current is removed from the wire, the voltage rises and consequently more actuation is produced by the remaining producers to reduce the demand from the consumers. Conversely, a decrease in demand (smaller conductances) causes less current to be added to the wire, consequently decreasing marketwire 64 voltage. Production therefore decreases, and demand by other consumers increases.

Please replace the paragraph beginning at page 22 at line 12, beginning with "For certain applications...", with the following rewritten paragraph:

C5

For certain applications, the foregoing behavior (producers all on/all off) is not desirable since it is sometimes necessary to insure that all actuators or

consumers participate in the market so that only a few do not end up dominating the market (monopolize the market). This more equitable allocation can be implemented using a circuit 222 shown in Figure 14 to ensure that threshold voltage shifts instantly at each turn-on/turn-off transition, then exponentially decays back to its original state (see graphic 224, with step 226 and exponential decay graphic 228 illustrated, the transition following formula 227). In operation, for a turn-on transition, the threshold voltage first shifts to the left, making it more difficult for a connected producer to shut off, then gradually decays to the right, increasing the probability of producer turn-off. As would be expected, the opposite occurs for turn-off producer transitions. The hysteretic circuit causes individual actuators to reduce the desire to produce the longer production has continued. In this way, the actuation is shared among the producers; no one actuator does it all.